Amendments to the Claims

1. (Previously Presented) Method for interference suppression for time-division multiple access (TDMA) and/or frequency division multiple access (FDMA) transmission, which at least approximately can be described as pulse amplitude modulation, with an arbitrary number of receive antennas, which comprises the following steps:

a) filtering of at least one complex-valued received signal $r_i(k)$ of one receive antenna with a filter with complex-valued coefficients $f_i(k)$ for generation of at least one output signal $y_i(k)$;

b) forming at least one orthogonal projection of at least one output signal $y_i(k)$ onto a vector $\boldsymbol{p}_i$ which is assigned to this output signal $y_i(k)$; and

if the number of output signals $y_i(k)$ is one:

c1) feeding the output signal $y_i(k)$ into a device for detection, especially equalization; or

if the number or output signals $y_i(k)$ is two or more:

d1) summing of a majority, especially all of the output signals $y_i(k)$ for forming a sum signal s(k); and

d2) feeding the sum signal s(k) into a device for detection, especially equalization,

wherein at least two received signals $r_i(k)$ are available and the corresponding at least two outputs $y_i(k)$ are projected onto identical vectors in step b).

2. (Cancelled)

3. (Previously Presented) Method for interference suppression for time-division multiple access (TDMA) and/or frequency division multiple access (FDMA) transmission, which at least approximately can be described as pulse amplitude modulation, with an arbitrary number of receive antennas, which comprises the following steps:

a) filtering of at least one complex-valued received signal $r_i(k)$ of one receive antenna with a filter with complex-valued coefficients $f_i(k)$ for generation of at least one output signal $y_i(k)$;

b) forming at least one orthogonal projection of at least one output signal $y_i(k)$ onto a vector $\boldsymbol{p}_i$ which is assigned to this output signal $y_i(k)$; and

if the number of output signals $y_i(k)$ is one:

c1) feeding the output signal $y_i(k)$ into a device for detection, especially equalization; or

if the number or output signals $y_i(k)$ is two or more:

d1) summing of a majority, especially all of the output signals $y_i(k)$ for forming a sum signal s(k); and

d2) feeding the sum signal s(k) into a device for detection, especially equalization,

wherein feedforward filters of a decision-feedback-equalization (DFE) with real-valued feedback filter are used for filtering of the received signals in step a),

which are optimized systematically,

in particular according to the criteria zero-forcing (ZF), minimum mean-squared (MMSE), or impulse truncation.

4. (Cancelled).

5. (Currently Amended) Method for interference suppression for time-division multiple access (TDMA) and/or frequency division multiple access (FDMA) transmission, which at least approximately can be described as pulse amplitude modulation, with an arbitrary number of receive antennas, which comprises the following steps:

a) filtering of at least one complex-valued received TDMA or FDMA signal $r_i(k)$ of one receive antenna with a filter with complex-valued coefficients $f_i(k)$ for generation of at least one output signal $y_i(k)$;

b) forming at least one orthogonal projection of at least one output signal $y_i(k)$ onto a vector $\boldsymbol{p}_i$ which is assigned to this output signal $y_i(k)$; and

if the number of output signals $y_i(k)$ is one:

c1) feeding the output signal $y_i(k)$ into a device for detection, especially equalization; or

if the number or output signals $y_i(k)$ is two or more:

d1) summing of a majority, especially all of the output signals $y_i(k)$ for forming a sum signal s(k); and

d2) feeding the sum signal s(k) into a device for detection, especially equalization,

wherein an arbitrary adaptive algorithm is used for adjustment of the filter coefficients of the at least one complex-valued filter.

6. (Original) Method as recited in Claim 5,

wherein the adaptive algorithm for adjustment of the filter coefficients utilizes a training sequence which is known at the receiver.

7. (Original) Method as recited in Claim 5,

wherein a blind adaptive algorithm is used for adjustment of the filter coefficients.

8. (Currently Amended) Method for interference suppression for time-division multiple access (TDMA) and/or frequency division multiple access (FDMA) transmission, which at least approximately can be described as pulse amplitude modulation, with an arbitrary number of receive antennas, which comprises the following steps:

a) filtering of at least one complex-valued received <u>TDMA or FDMA</u> signal $r_i(k)$ of one receive antenna with a filter with complex-valued coefficients $f_i(k)$ for generation of at least one output signal $y_i(k)$;

b) forming at least one orthogonal projection of at least one output signal $y_i(k)$

onto a vector $\boldsymbol{p}_i$ which is assigned to this output signal $y_i(k)$; and

if the number of output signals $y_i(k)$ is one:

c1) feeding the output signal $y_i(k)$ into a device for detection, especially equalization; or

if the number or output signals $y_i(k)$ is two or more:

d1) summing of a majority, especially all of the output signals $y_i(k)$ for forming a sum signal s(k); and

d2) feeding the sum signal s(k) into a device for detection, especially equalization,

wherein the corresponding orthogonal complements of the projections of at least one filtered output signal $y_i(k)$ are calculated.

9. (Currently Amended) Method for interference suppression for time-division multiple access (TDMA) and/or frequency division multiple access (FDMA) transmission, which at least approximately can be described as pulse amplitude modulation, with an arbitrary number of receive antennas, which comprises the following steps:

a) filtering of at least one complex-valued received TDMA or FDMA signal $r_i(k)$ of one receive antenna with a filter with complex-valued coefficients $f_i(k)$ for generation of at least one output signal $y_i(k)$;

b) forming at least one orthogonal projection of at least one output signal $y_i(k)$ onto a vector $\boldsymbol{p}_i$ which is assigned to this output signal $y_i(k)$; and

if the number of output signals $y_i(k)$ is one:

c1) feeding the output signal $y_i(k)$ into a device for detection, especially equalization; or

if the number or output signals $y_i(k)$ is two or more:

d1) summing of a majority, especially all of the output signals $y_i(k)$ for forming a sum signal s(k); and

d2) feeding the sum signal s(k) into a device for detection, especially equalization,

wherein for the case of transmit antenna diversity, at least a part of the transmit signals is interpreted as interference and treated with the method for interference suppression.

10. (Previously Presented) System for interference suppression for time-division multiple access (TDMA) and/or frequency division multiple access (FDMA) transmission, which at least approximately can be described as pulse amplitude modulation, comprising

- an arbitrary number of receive antennas;
- at least one filter device with complex-valued coefficients $f_i(k)$ for filtering of at least one complex-valued received signal $r_i(k)$ of one receive antenna for forming at least one output signal $y_i(k)$;
- at least one projection device for forming an orthogonal projection of the at least one output signal $y_i(k)$ onto a vector $\boldsymbol{p}_i$ which is assigned to this output signal;

and

if the number of output signals $y_i(k)$ is one:

- a detection device which processes the output signal

s(k); or

if the number or output signals $y_i(k)$ is two or more:

- a summation device for summing a majority, in particular all output signals

$y_i(k)$ for forming a sum signal s(k); and

- a detection device which processes the sum signal s(k), wherein at least two received signals $r_i(k)$ are available

and the corresponding at least two outputs $y_i(k)$ are projected

onto identical vectors by the at least one projection device.

11. (Previously Presented) Receiver designed for acting in concert with one or several receiving antennae for interference suppression for time-division multiple access (TDMA) and/or frequency division multiple access (FDMA) transmission comprising at least pulse amplitude modulation or binary continuous phase modulation (CPM), comprising:

- at least a filtering device including complex-valued coefficients $f_i(k)$, with the at least one filtering device being designed for filtering at least one complex-valued received signal $r_i(k)$ of a receiving antennae for generating at least one output signal $y_i(k)$;

wherein

the receiver further comprises

- at least one projection device to which the at least one output signal $y_i(k)$ is coupled for forming an orthogonal projection P_i of the at least one output signal $y_i(k)$ onto a direction vector $\boldsymbol{p}_i$ assigned to this output signal $y_i(k)$, with the dimension of the direction vector $\boldsymbol{p}_i$ irrespective of the number of receiving antennae being two; and

in case the number of the projections P_i is one:

- a device for detection to which the output signal of the projection P_i is coupled;

  or

in case the number of the projections is two or more:

- a device for summing a majority of the projections P_i for forming a sum signal s(k); and
- a device for detection to which the sum signal s[k] is coupled,

  wherein at least two received signals $r_i(k)$ are available

and the corresponding at least two outputs $y_i(k)$ are projected

onto identical vectors by the at least one projection device.

12. (Previously Presented) System for interference suppression for time-division multiple access (TDMA) and/or frequency division multiple access (FDMA) transmission, which at least approximately can be described as pulse amplitude modulation, comprising

- an arbitrary number of receive antennas;

- at least one filter device with complex-valued coefficients $f_i(k)$ for filtering of at least one complex-valued received signal $r_i(k)$ of one receive antenna for forming at least one output signal $y_i(k)$;

- at least one projection device for forming an orthogonal projection of the at least one output signal $y_i(k)$ onto a vector $\boldsymbol{p}_i$ which is assigned to this output signal; and

if the number of output signals $y_i(k)$ is one:

- a detection device which processes the output signal

s(k); or

if the number or output signals $y_i(k)$ is two or more:

- a summation device for summing a majority, in particular all output signals $y_i(k)$ for forming a sum signal s(k); and

- a detection device which processes the sum signal s(k),

wherein feedforward filters of a decision-feedback-equalization (DFE) with real-valued feedback filter are used for filtering of the received signals, which are optimized systematically, in particular according to the criteria zero-forcing (ZF), minimum mean-squared (MMSE), or impulse truncation.

13. (Cancelled).

14. (Currently Amended) System for interference suppression for time-division multiple access (TDMA) and/or frequency division multiple access (FDMA) transmission, which at least approximately can be described as pulse amplitude modulation, comprising

- an arbitrary number of receive antennas;
- at least one filter device with complex-valued coefficients $f_i(k)$ for filtering of at least one complex-valued received <u>TDMA or FDMA</u> signal $r_i(k)$ of one receive antenna for forming at least one output signal $y_i(k)$;
- at least one projection device for forming an orthogonal projection of the at least one output signal $y_i(k)$ onto a vector $\boldsymbol{p}_i$ which is assigned to this output signal; and

if the number of output signals $y_i(k)$ is one:

- a detection device which processes the output signal

s(k); or

if the number or output signals $y_i(k)$ is two or more:

- a summation device for summing a majority, in particular all output signals $y_i(k)$ for forming a sum signal s(k); and
- a detection device which processes the sum signal s(k),

wherein an adjustment device uses an arbitrary adaptive algorithm for adjusting the filter coefficients of the at least one complex-valued filter device.

15. (Previously Presented) System as recited in Claim 14,

wherein the adaptive algorithm for adjustment of the filter coefficients utilizes a training sequence which is known at the receiver.

16. (Previously Presented) System as recited in Claim 14,

wherein a blind adaptive algorithm is used for adjustment of the filter coefficients.

17. (Currently Amended) System for interference suppression for time-division multiple access (TDMA) and/or frequency division multiple access (FDMA) transmission, which at least approximately can be described as pulse amplitude modulation, comprising

- an arbitrary number of receive antennas;
- at least one filter device with complex-valued coefficients $f_i(k)$ for filtering of at least one complex-valued received <u>TDMA or FDMA</u> signal $r_i(k)$ of one receive antenna for forming at least one output signal $y_i(k)$;
- at least one projection device for forming an orthogonal projection of the at least one output signal $y_i(k)$ onto a vector $\boldsymbol{p}_i$ which is assigned to this output signal; and

if the number of output signals $y_i(k)$ is one:

- a detection device which processes the output signal

s(k); or

if the number or output signals $y_i(k)$ is two or more:

- a summation device for summing a majority, in particular all output signals $y_i(k)$ for forming a sum signal $s(k)$; and

- a detection device which processes the sum signal $s(k)$,

wherein a calculating device calculates the corresponding orthogonal complements of the projections of at least one filtered output signal $y_i(k)$.

18. (Currently Amended) System for interference suppression for time-division multiple access (TDMA) and/or frequency division multiple access (FDMA) transmission, which at least approximately can be described as pulse amplitude modulation, comprising

- an arbitrary number of receive antennas;

- at least one filter device with complex-valued coefficients $f_i(k)$ for filtering of at least one complex-valued received TDMA or FDMA signal $r_i(k)$ of one receive antenna for forming at least one output signal $y_i(k)$;

- at least one projection device for forming an orthogonal projection of the at least one output signal $y_i(k)$ onto a vector $\boldsymbol{p}_i$ which is assigned to this output signal; and

if the number of output signals $y_i(k)$ is one:

- a detection device which processes the output signal $s(k)$; or

if the number or output signals $y_i(k)$ is two or more:

- a summation device for summing a majority, in particular all output signals $y_i(k)$ for forming a sum signal $s(k)$,

wherein for the case of transmit antenna diversity, at least a part of the transmit signals is interpreted as interference and treated with the system for interference suppression.

19. (Previously Presented) Receiver designed for acting in concert with one or several receiving antennae for interference suppression for time-division multiple access (TDMA) and/or frequency division multiple access (FDMA) transmission comprising at least pulse amplitude modulation or binary continuous phase modulation (CPM), comprising:

- at least a filtering device including complex-valued coefficients $f_i(k)$, with the at least one filtering device being designed for filtering at least one complex-valued received signal $r_i(k)$ of a receiving antennae for generating at least one output signal $y_i(k)$;

wherein

the receiver further comprises

- at least one projection device to which the at least one output signal $y_i(k)$ is coupled for forming an orthogonal projection P_i of the at least one output signal $y_i(k)$ onto a direction vector $\boldsymbol{p}_i$ assigned to this output signal $y_i(k)$, with the dimension of the direction vector $\boldsymbol{p}_i$ irrespective of the number of receiving antennae being two; and

in case the number of the projections P_i is one:

- a device for detection to which the output signal of the projection P_i is coupled;

  or

in case the number of the projections is two or more:

- a device for summing a majority of the projections P_i for forming a sum signal s(k); and
- a device for detection to which the sum signal s[k] is coupled;

wherein feedforward filters of a decision-feedback-equalization (DFE) with real-valued feedback filter are used for filtering of the received signals, which are optimized systematically, in particular according to the criteria zero-forcing (ZF), minimum mean-squared (MMSE), or impulse truncation..

20. (Cancelled).

21. (Currently Amended) Receiver designed for acting in concert with one or several receiving antennae for interference suppression for time-division multiple access (TDMA) and/or frequency division multiple access (FDMA) transmission comprising at least pulse amplitude modulation or binary continuous phase modulation (CPM), comprising:

- at least a filtering device including complex-valued coefficients $f_i(k)$, with the at least one filtering device being designed for filtering at least one complex-

valued received <u>TDMA or FDMA</u> signal $r_i(k)$ of a receiving antennae for generating at least one output signal $y_i(k)$;

wherein

the receiver further comprises

- at least one projection device to which the at least one output signal $y_i(k)$ is coupled for forming an orthogonal projection P_i of the at least one output signal $y_i(k)$ onto a direction vector $\boldsymbol{p}_i$ assigned to this output signal $y_i(k)$, with the dimension of the direction vector $\boldsymbol{p}_i$ irrespective of the number of receiving antennae being two; and

in case the number of the projections P_i is one:

- a device for detection to which the output signal of the projection P_i is coupled;

or

in case the number of the projections is two or more:

- a device for summing a majority of the projections P_i for forming a sum signal $s(k)$; and
- a device for detection to which the sum signal $s[k]$ is coupled,

wherein an adjustment device uses an arbitrary adaptive algorithm for adjusting the filter coefficients of the at least one complex-valued filter device.

22. (Previously Presented) Receiver as recited in Claim 21,

wherein the adaptive algorithm for adjustment of the filter coefficients utilizes a training sequence which is known at the receiver.

23. (Previously Presented) Receiver as recited in Claim 21,

wherein a blind adaptive algorithm is used for adjustment of the filter coefficients.

24. (Currently Amended) Receiver designed for acting in concert with one or several receiving antennae for interference suppression for time-division multiple access (TDMA) and/or frequency division multiple access (FDMA) transmission comprising at least pulse amplitude modulation or binary continuous phase modulation (CPM), comprising:

- at least a filtering device including complex-valued coefficients $f_i(k)$, with the at least one filtering device being designed for filtering at least one complex-valued received <u>TDMA or FDMA</u> signal $r_i(k)$ of a receiving antennae for generating at least one output signal $y_i(k)$;

wherein

the receiver further comprises

- at least one projection device to which the at least one output signal $y_i(k)$ is coupled for forming an orthogonal projection P_i of the at least one output signal $y_i(k)$ onto a direction vector $\boldsymbol{p}_i$ assigned to this output signal $y_i(k)$, with

the dimension of the direction vector $\boldsymbol{p}_i$ irrespective of the number of receiving antennae being two; and

in case the number of the projections P_i is one:

- a device for detection to which the output signal of the projection P_i is coupled;

  or

in case the number of the projections is two or more:

- a device for summing a majority of the projections P_i for forming a sum signal s(k); and
- a device for detection to which the sum signal s[k] is coupled,

  wherein a calculating device calculates the corresponding orthogonal complements of the projections of at least one filtered output signal $y_i(k)$.

25. (Currently Amended) Receiver designed for acting in concert with one or several receiving antennae for interference suppression for time-division multiple access (TDMA) and/or frequency division multiple access (FDMA) transmission comprising at least pulse amplitude modulation or binary continuous phase modulation (CPM), comprising:

- at least a filtering device including complex-valued coefficients $f_i(k)$, with the at least one filtering device being designed for filtering at least one complex-valued received TDMA or FDMA signal $r_i(k)$ of a receiving antennae for generating at least one output signal $y_i(k)$;

wherein

the receiver further comprises

- at least one projection device to which the at least one output signal $y_i(k)$ is coupled for forming an orthogonal projection P_i of the at least one output signal $y_i(k)$ onto a direction vector $\boldsymbol{p}_i$ assigned to this output signal $y_i(k)$, with the dimension of the direction vector $\boldsymbol{p}_i$ irrespective of the number of receiving antennae being two; and

in case the number of the projections P_i is one:

- a device for detection to which the output signal of the projection P_i is coupled;

or

in case the number of the projections is two or more:

- a device for summing a majority of the projections P_i for forming a sum signal s(k); and
- a device for detection to which the sum signal s[k] is coupled,

wherein for the case of transmit antenna diversity, at least a part of the transmit signals is interpreted as interference and treated with the receiver for interference suppression.